Vol. 4 No. 1 Edisi November – Januari 2027 E. ISSN. 3032-2472
Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

ANALYSIS OF THE FEASIBILITY AND INFLUENCE OF MATHEMATICS LEARNING MEDIA BASED ON REALISTIC MATHEMATICS EDUCATION ON STUDENTS' UNDERSTANDING OF CONCEPTS AT STATE ELEMENTARY SCHOOL 89 PALEMBANG: A LITERATURE STUDY

ANALISIS KELAYAKAN DAN PENGARUH MEDIA PEMBELAJARAN MATEMATIKA BERBASIS REALISTIC MATHEMATICS EDUCATION TERHADAP PEMAHAMAN KONSEP SISWA SD NEGERI 89 PALEMBANG: STUDI LITERATUR

Tohap Panuturi Sihombing[1*], Riandita KD Pasaribu[2], Mery Natalia Br. Hutahuruk[3], Feby Fransiska Siregar[4], Maya Alemina Ketaren[5], Elvi Mailani[6]

[1*]State University of Medan, Email: tohapsihombing14@gmail.com
[2]State University of Medan, Email: rianditakdpasaribu.unimed24@gmail.com
[3]State University of Medan, Email: merynatalia1243111216@mhs.unimed.ac.id
[4]State University of Medan, Email: febysiregar2006@gmail.com
[5]State University of Medan, Email: mayaalemina@unimed.ac.id
[6]State University of Medan, Email: Elvimailani@unimed.ac.id

*email koresponden: tohapsihombing14@gmail.com

DOI: https://doi.org/10.62567/micjo.v4i1.3466

Abstract

Conceptual understanding is a fundamental part of elementary mathematics learning, yet instruction often emphasizes memorizing procedures and makes limited use of media that match students' stage of thinking. Realistic Mathematics Education (RME) combined with concrete media is one alternative that has been widely studied. However, a learning medium should not only be tested for its effect; its feasibility must also be examined through validity, practicality, and effectiveness. This study aims to analyze the feasibility and the effect of RME-based mathematics learning media on elementary students' conceptual understanding, using SD Negeri 89 Palembang as a reference case. This study employed a qualitative approach with a literature review method of 15 journal articles published between 2022 and 2026. The analysis was conducted by identifying, categorizing, comparing, and synthesizing findings based on the themes of RME media characteristics, product feasibility, and effects on conceptual understanding. The findings indicate that RME-based media developed in previous studies are generally valid and practical and effective in improving learning achievement. The study at SD Negeri 89 Palembang reported that the experimental class mean score (59.55) was higher than that of the control class (46) with a significance value of 0.032, but it did not directly report a feasibility test of the medium. This review proposes a conceptual flow for testing the

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

feasibility of RME media that can be further examined through empirical research.

Keywords : Product Feasibility, Realistic Mathematics Education, Concrete Media, Conceptual Understanding, Elementary Mathematics.

Abstrak

Pemahaman konsep merupakan fondasi penting dalam pembelajaran matematika sekolah dasar, tetapi pembelajaran yang berlangsung masih sering menekankan hafalan prosedur dan kurang memanfaatkan media yang sesuai dengan tahap berpikir siswa. Realistic Mathematics Education (RME) yang dipadukan dengan media konkret menjadi salah satu alternatif yang banyak dikaji. Namun, media yang digunakan tidak cukup hanya diuji pengaruhnya; media perlu dinilai kelayakannya melalui uji validitas, kepraktisan, dan keefektifan. Penelitian ini bertujuan menganalisis kelayakan dan pengaruh media pembelajaran matematika berbasis RME terhadap pemahaman konsep siswa sekolah dasar dengan SD Negeri 89 Palembang sebagai kasus rujukan. Penelitian menggunakan pendekatan kualitatif dengan metode studi literatur terhadap 15 artikel jurnal yang terbit pada rentang 2022–2026. Analisis dilakukan dengan mengidentifikasi, mengelompokkan, membandingkan, dan mensintesis temuan berdasarkan tema karakteristik media RME, kelayakan produk, dan pengaruh terhadap pemahaman konsep. Hasil kajian menunjukkan bahwa media RME yang dikembangkan pada penelitian terdahulu umumnya berada pada kategori valid dan praktis, serta efektif meningkatkan capaian belajar. Penelitian di SD Negeri 89 Palembang melaporkan rata-rata hasil belajar kelas eksperimen (59,55) lebih tinggi daripada kelas kontrol (46) dengan signifikansi 0,032, tetapi belum melaporkan uji kelayakan media secara langsung. Kajian ini menghasilkan rancangan konseptual alur uji kelayakan media RME yang dapat diuji lebih lanjut melalui penelitian empiris.

Kata Kunci : Kelayakan Produk, *Realistic Mathematics Education*, Media Konkret, Pemahaman Konsep, Matematika Sekolah Dasar.

1. INTRODUCTION

Mathematics learning in elementary schools is not enough to just direct students to the ability to calculate. Students need to understand the meaning behind procedures, connect mathematical ideas, and use that knowledge in different situations. Andrias et al. (2026) explained that students who have a good understanding of concepts will find it easier to relate mathematical ideas and apply them, but in the field learning is often done through rote memorization without adequate understanding of the concepts. This condition is related to the characteristics of elementary school students who are still at the concrete operational stage and therefore require direct experience with real objects to build understanding (Andrias et al., 2026; Arju et al., 2025).

Similar conditions were reported at SD Negeri 89 Palembang. Arjun et al. (2025) stated that students' mathematics learning outcomes at these schools are still low because learning still uses conventional methods and is not supported by media that is appropriate to students' cognitive development stages. This research applies the RME model assisted by concrete media on addition and subtraction material in class II with a posttest-only control group design. The results show that the average score for the experimental class is 59.55 and the control class is 46, with a significance value of 0.032 in the independent sample t-test.

RME views mathematics as a human activity that starts from meaningful contextual problems. Khasanah et al. (2025) through a literature review concluded that RME is consistently superior to conventional learning in improving elementary school students' problem solving abilities, as referred to by Andrias et al. (2026). In multiplication material, RME has been combined with various media,

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

including stick media (Hanami & Nurabkafiya, 2026), traditional games (Zakaria & Dewantara, 2024), and manipulative media (Umar & Zakaria, 2022). Indriani et al. (2022) also studied the understanding of the concept of multiplication using the RME method in class III students, while Filiz and Güneş (2023) applied RME-based multiplication teaching to students who were at risk of experiencing difficulties learning mathematics.

Apart from testing its influence, learning media as a development product needs to be tested for its feasibility. In mathematics development research, feasibility is generally seen from three aspects, namely validity, practicality and effectiveness. Prafianti et al. (2022) developed student worksheets based on a realistic mathematical approach using the Plomp model and assessed its practicality and effectiveness. Putra et al. (2023) developed an RME-based KOSIKA comic which was considered valid, practical and interesting to facilitate understanding of multiplication in class II. Gradini et al. (2022) added that the quality of development products in mathematics can also be viewed from the aspect of reliability in addition to validity, practicality and effectiveness. Windiani et al. (2025) developed low-cost concrete teaching aids which were tested for their feasibility and learning effectiveness in class III multiplication.

Based on these various studies, it appears that studies on the influence of RME assisted by concrete media and studies on media feasibility are generally discussed separately. Research at SD Negeri 89 Palembang, for example, focused on the influence on learning outcomes and did not report feasibility tests on the media used. Therefore, this research aims to (1) analyze the feasibility of RME-based mathematics learning media based on aspects of validity, practicality and effectiveness; (2) analyze its influence on elementary school students' understanding of concepts; and (3) formulate the implications for mathematics learning at SD Negeri 89 Palembang.

2. RESEARCH METHOD

This research employed a qualitative approach using a literature review method. The literature review was used to identify, compare, and synthesize the results of previous research related to RME-based mathematics learning media, product development feasibility testing, and elementary school students' conceptual understanding. This study did not involve field data collection. Public Elementary School 89 Palembang was used as a reference case based on published research articles at that location.

The data sources consisted of 15 journal articles published between 2022 and 2026. Articles were searched through journal portals and databases such as DOAJ, Garuda, and the publisher's official website. Article selection criteria included (1) discussing RME, concrete or manipulative media, or mathematics learning product development; (2) containing comparable research or study results; (3) published within the last five years; and (4) having a traceable publication identity, namely a DOI or article link address.

The analysis stage was conducted by reading and recording the objectives, methods, subjects, and research results of each article. Furthermore, the research results were grouped by theme, compared to see the similarities and differences, then synthesized into a conceptual design for the feasibility test of RME media. The fifteen sources analyzed consisted of eight articles on the influence or effectiveness of RME (including research at SD Negeri 89 Palembang), two articles on manipulative media or concrete teaching aids, four articles on the development and feasibility of RME-based products, and one article on the quality criteria of development products in mathematics.

3. RESULTS AND DISCUSSION

Characteristics of RME-Based Mathematics Learning Media

Research results indicate that RME media not only functions as a visual aid or calculation aid, but also becomes part of the learning process, starting with contextual problems. Andrias et al. (2026) implemented RME learning in five phases: contextual problem presentation, exploration with concrete manipulatives, discussion and guided reinvention, abstraction and formalization, and reflection and application. The concrete media used included marbles, popsicle sticks, magnetic buttons, mineral

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

water glasses, number cards, and multiplication cards. In a study at SD Negeri 89 Palembang, the concrete media used were counting glasses for addition and subtraction (Arju et al., 2025).

The forms of RME media developed in other studies are quite diverse. Putra et al. (2023) developed a comic based on real-life situations to facilitate students' understanding of multiplication in second grade. Filahanasari et al. (2022) developed RME-based student worksheets for plane geometry at SDN 03 Tiumang. Windiani et al. (2025) developed a low-cost concrete teaching aid called Kalimatika for third-grade multiplication and concluded that locally made manipulatives can strengthen understanding of the concept of multiplication of whole numbers. This diversity indicates that the main element of RME media lies in its connection to real-world contexts and opportunities for students to rediscover concepts, rather than the physical form of the media. Siller and Ahmad (2024) also examined learning that combined concrete and virtual manipulatives on elementary school students' mathematics achievement, demonstrating that manipulatives are a key component of basic mathematics learning.

Product Development Feasibility Testing Framework

Product development feasibility testing in mathematics learning is conducted to ensure that the media is suitable for use before and after implementation in the classroom. Based on the reviewed articles, feasibility is assessed from three main aspects: validity, practicality, and effectiveness. Gradini et al. (2022) added a reliability aspect for products in the form of tests. A summary of this framework is presented in Table 1.

Table 1. Framework for Feasibility Testing of RME-Based Mathematics Learning Media

Aspect	Focus of assessment	Instrument	References
Validity	Suitability of mathematical material content, media design, and context with learning objectives	Validation sheet of material experts and media experts	Putra et al. (2023); Suanto et al. (2023); Filahanasari et al. (2022)
Practicality	Ease of use, benefits, and attractiveness for teachers and students	Student and teacher response questionnaire	Prafianti et al. (2022); Suanto et al. (2023); Filahanasari et al. (2022)
Effectiveness	Achievement of learning outcomes or understanding of concepts after using media	Learning outcome test, t-test	Filahanasari et al. (2022); Prafianti et al. (2022); Andrias et al. (2026)
Reliability (for tests)	Consistency of the test instruments used	Test pilot and reliability analysis	Gradini et al. (2022); Andrias et al. (2026)

Results of the RME Media Feasibility Test in Previous Research

Validity

The development research reviewed generally produced products categorized as valid. Putra et al. (2023) reported a validity of 92.85% for the KOSIKA comic by material experts and 100% for media experts, categorizing it as valid for development. Suanto et al. (2023) developed an RME learning tool for the topic of circles using a 4D model. Validation results from three validators showed that the syllabus, lesson plan, and learning objectives were categorized as highly valid, with average scores of 98.86%, 95.27%, and 90.84%, respectively. Filahanasari et al. (2022) also reported that the RME-based worksheet was declared valid by expert assessment.

Practicality

Practicality was assessed based on user responses. Prafianti et al. (2022) reported that students at SMPN 1 Sukodadi received a good response to the circle worksheet (LKS), with a usefulness rating

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

of 74.58%, ease of use rating of 75%, and presentation appeal rating of 73.96%. Suanto et al. (2023) reported a practicality rating of 84.98%, with practical criteria. At the elementary school level, Filahanasari et al. (2022) obtained a teacher questionnaire score of 3.75 and a student questionnaire score of 3.625 for the developed LKPD.

Effectiveness

Effectiveness is generally measured by learning outcomes after media use. Prafianti et al. (2022) reported that 80% of students achieved classical learning mastery on a mathematical problem-solving ability test. Filahanasari et al. (2022) reported an increase in the average score from 50.5 in the pretest to 72.75 in the posttest, with a significance level of 0.00. Gradini et al. (2022) used a two-tailed t-test to assess the effectiveness of the HOTS test they developed. This demonstrates that development research generally does not stop at expert validation, but continues with limited trials and effectiveness testing.

It should be noted that the aforementioned studies were conducted on different materials, levels, and subjects. Prafianti et al. (2022) and Suanto et al. (2023) were conducted on junior high school students, so their results are used in this study primarily to illustrate the procedures and criteria for the feasibility test, not as direct evidence for elementary school students.

The Effect of RME Media on Conceptual Understanding

The study most closely focused on conceptual understanding is that of Andrias et al. (2026) on third-grade students. Using a quasi-experimental design involving 55 students, the experimental group learning with RME aided by concrete manipulative media achieved an average posttest score of 83.60 for conceptual understanding of multiplication, higher than the control group's score of 67.68 ($t = 5.731$; $p < 0.001$). The experimental group's average increase from pretest to posttest was also greater than that of the control group. Andrias et al. (2026) reported that these findings are consistent with the results of Hanami and Nurabkafiya (2026) who examined the effect of RME aided by stick media on conceptual understanding of multiplication.

Conceptual understanding in this study was measured using indicators such as the ability to represent concepts in concrete forms, pictures, and symbols; understanding the relationship between concepts and procedures; providing examples and non-examples; applying concepts to real-world problems; and and understanding the structure and properties of operations (Andrias et al., 2026). This indicator can be used as a reference for developing conceptual understanding tests for other topics, including addition and subtraction. Results pointing to the superiority of RME are also referenced by Umar and Zakaria (2022) in their problem-solving skills, and by Khasanah et al. (2025) in their literature review of elementary school students.

Conceptually, these findings can be explained by the role of concrete media in helping students move from concrete to symbolic representations. Students are not directly confronted with symbols, but instead begin with contextual problems, manipulate objects, discuss the results, and then formulate concepts formally (Andrias et al., 2026). Therefore, the influence of RME media on conceptual understanding is highly dependent on the quality of the media design and the learning flow, making media feasibility testing essential before measuring its impact.

Case of SD Negeri 89 Palembang

Research by Arju et al. (2025) was carried out in class II A as an experimental class and class II B as a control class at SD Negeri 89 Palembang with a total of 27 students. The sampling technique is total sampling, and the instrument is a multiple choice test whose validity and reliability have been tested. The average value for the experimental class is 59.55 and the control class is 46, with a significance value of 0.032 which is below 0.05. These findings show that there are significant differences in learning outcomes between RME learning assisted by concrete media and conventional learning.

However, there are several notes in reading these findings. First, the variables measured are learning outcomes in the cognitive domain, not specific understanding of concepts, so the relationship with conceptual understanding is indirect. Second, the posttest-only design does not contain a pretest

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

so that equality in the initial abilities of the two classes cannot be seen from the reported data. Third, the sample size is small and the average for the two classes is still in the range of 46 to 59.55, so the higher achievement of the experimental class does not mean that the learning achievement is high. Fourth, the article reports tests on the validity and reliability of the test instrument, but does not report expert validation or practicality tests on counting glass media. In other words, evidence of influence already exists, while evidence of media suitability still needs to be completed.

When compared with Andrias et al. (2026) which involved 55 students with a pretest and posttest and tested two dependent variables, research at SD Negeri 89 Palembang had a more limited scope. This does not mean that the findings are not useful, but shows that further research needs to add pretests, enlarge the sample, and measure concept understanding with clear indicators.

RME Media Feasibility Testing Flowchart

Based on the literature synthesis, the feasibility test for RME-based mathematics learning media can be structured in the following flow:

Contextual media design → Expert validation → Revision → Limited trial (practicality) → RME learning with media → Concept understanding test (effectiveness) → Revision and follow-up

The first stage is media design. Teachers select contexts familiar to students and readily available, concrete media, such as cups, sticks, or buttons, as used in Arju et al. (2025) and Andrias et al. (2026). The second stage is validation by subject matter and media experts to assess the suitability of the mathematical content, context, and media design (Putra et al., 2023; Suanto et al., 2023). The third stage is revision based on the validator's suggestions. The fourth stage is a limited trial in small groups to assess practicality through teacher and student response questionnaires (Prafianti et al., 2022; Filahanasari et al., 2022). The fifth stage is the implementation of RME learning using media, following the phases of contextual problem presentation, exploration with concrete media, discussion, formalization, and reflection (Andrias et al., 2026). The sixth stage is measuring conceptual understanding and effectiveness through tests that have been tested for validity and reliability (Gradini et al., 2022). The final stage is revision and follow-up based on the results of all stages.

Relation to Mathematics Material

This flow can be applied to addition and subtraction material, as in the study at SD Negeri 89 Palembang. As an illustration, students were given a contextual problem about dividing drinking glasses into several groups. Students then arranged and moved counting glasses to find the addition and subtraction results, discussed the solution, and then wrote the results in mathematical sentences. This illustration is the author's design based on a literature synthesis and has not been empirically tested. During the feasibility test phase, subject matter experts can assess the accuracy of the addition and subtraction concepts represented by the media, while media experts assess the size, clarity, and safety of the objects used. Teachers and students then assess the ease and appeal of the media. Conceptual understanding tests can be structured based on indicators of representation, the relationship between concepts and procedures, examples and non-examples, application to real-world problems, and operational structures (Andrias et al., 2026).

Forms of Instruments That Can Be Developed

Based on this synthesis, feasibility test instruments can be structured in several forms.

Validity:

• Subject matter expert validation sheet;
• Media expert validation sheet;

Practicality:

• Student response questionnaire;
• Teacher response questionnaire;
• RME learning implementation sheet;

Effectiveness and conceptual understanding:

• Conceptual understanding test based on indicators;
• Pretest and posttest to assess improvement;

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

• Reliability test and item analysis.

With this development, media evaluation not only produces conclusions about whether the media is influential, but also information about parts of the media that need to be improved.

4. CONCLUSION

Based on a literature review of 15 articles, it can be concluded that the RME-based mathematics learning media developed in previous research are generally valid and practical, and have demonstrated effectiveness in improving learning outcomes. Research on RME supported by concrete media also demonstrates a positive impact on conceptual understanding, particularly in multiplication in elementary schools. Research at SD Negeri 89 Palembang reported significant differences in learning outcomes between the experimental and control classes, but did not report a direct feasibility test of the media. Therefore, evidence of the feasibility of the counting cups media still needs to be completed. Based on this synthesis, the feasibility test for RME media can be conducted through a process of media design, expert validation, revision, limited trials, RME learning, conceptual understanding tests, and revision and follow-up. This design is the result of a literature synthesis and therefore still requires empirical testing. Future research is recommended to use a pretest-posttest design, a larger sample size, and a conceptual understanding instrument with clear indicators.

5. REFERENCES

Andrias, A., Widiyasari, R., & Eminita, V. (2026). Pengaruh Realistic Mathematics Education (RME) berbantuan media manipulatif konkret terhadap pemahaman konsep dan kemampuan pemecahan masalah perkalian kelas III sekolah dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 11*(2), 206–219. https://journal.unpas.ac.id/index.php/pendas/article/download/52065/29227

Arju, A., Surmilasari, N., & Jayanti. (2025). Pengaruh model Realistic Mathematics Education (RME) berbantuan media konkret terhadap hasil belajar matematika siswa kelas II SD. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 10*(3), 266–273. https://doi.org/10.23969/jp.v10i03.30218

Filahanasari, E., Fitriyani, N. H., & Putri, S. R. (2022). Pengembangan LKPD berbasis Realistic Mathematics Education pada materi bangun datar di kelas IV SDN 03 Tiumang. *Jurnal Inovasi Pendidikan dan Pembelajaran Sekolah Dasar, 6*(2), 133–142. https://doi.org/10.24036/jippsd.v6i2.118119

Filiz, T., & Güneş, G. (2023). Teaching multiplication based on realistic mathematics education to students at risk of mathematics learning difficulties. *Journal of Family Counseling and Education, 8*(2), 193–211. https://doi.org/10.32568/jfce.1372345

Gradini, E., Khairunnisak, C., & Noviani, J. (2022). Development of higher-order thinking skill (HOTS) test on mathematics in secondary school. *Aksioma: Jurnal Program Studi Pendidikan Matematika, 11*(1). https://doi.org/10.24127/ajpm.v11i1.4649

Hanami, A. S., & Nurabkafiya, N. (2026). The effect of the realistic mathematics education (RME) learning model assisted by stick media on understanding the concept of multiplication. *GENFABET: Generasi Pendidikan Dasar, 2*(2), 29–39. https://doi.org/10.70152/genfabet.v2i2.343

Indriani, N., Salsabila, Z. P., & Firdaus, A. N. A. (2022). Pemahaman konsep perkalian dengan menggunakan metode RME pada peserta didik kelas III MI Miftahul Huda. *AULADUNA: Jurnal Pendidikan Dasar Islam, 9*(1). https://doi.org/10.24252/auladuna.v9i1a9.2022

Khasanah, N. U., Wiryanto, W., & Siswono, T. Y. E. (2025). The effectiveness of realistic mathematics education to improve student's problem solving skills in elementary schools: Literature review. *Jurnal Cakrawala Pendas, 11*(1). https://doi.org/10.31949/jcp.v11i1.12186

Prafianti, R. A., Anjarsari, E., & Ramadhani, A. (2022). Kepraktisan dan keefektifan lembar kerja siswa materi lingkaran berbasis pendekatan matematika realistik. *JKPM (Jurnal Kajian Pendidikan Matematika), 7*(2), 265–274. https://doi.org/10.30998/jkpm.v7i2.12797

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

Putra, D. T., Firdaus, F. M., & Oktari, V. (2023). Pengembangan KOSIKA (komik sekitar kita) berbasis pendekatan Realistic Mathematics Education untuk memfasilitasi pemahaman perkalian. *Aksioma: Jurnal Program Studi Pendidikan Matematika, 12*(4), 3683–3695. https://doi.org/10.24127/ajpm.v12i4.8135

Siller, H.-S., & Ahmad, S. (2024). The effect of concrete and virtual manipulative blended instruction on mathematical achievement for elementary school students. *Canadian Journal of Science, Mathematics and Technology Education, 24*(2), 229–266. https://doi.org/10.1007/s42330-024-00336-y

Suanto, E., Ginting, T. T. E., & Kartini, K. (2023). Pengembangan perangkat pembelajaran dengan pendekatan Realistic Mathematics Education untuk memfasilitasi kemampuan pemahaman matematis siswa. *Aksioma: Jurnal Program Studi Pendidikan Matematika, 12*(2), 1953–1964. https://doi.org/10.24127/ajpm.v12i2.6506

Umar, U. P. S., & Zakaria, Z. (2022). The effectiveness of the realistic math education (RME) learning method based on manipulative media in improving the problem-solving abilities of elementary school students. *Ekspose: Jurnal Penelitian Hukum dan Pendidikan, 21*(1). https://doi.org/10.30863/ekspose.v21i1.3405

Windiani, W., Maulana, M., & Isrok'atun, I. (2025). Development of a mathematics multiplication pocket as an instructional teaching aid for multiplication concepts in elementary school. *Ainara Journal, 6*(4). https://doi.org/10.54371/ainj.v6i4.1047

Zakaria, Z., & Dewantara, A. H. (2024). Understanding multiplication concept: Exploring PMRI-enhanced thematic learning using traditional games for primary teachers. *Jurnal Elemen, 10*(1), 55–70. https://doi.org/10.29408/jel.v10i1.19838